CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. (Currently Amended) A method of recovering from basic input/output system (BIOS) corruption in a multi-node computer with first and second nodes, a first firmware unit in the first node, and a second firmware unit in the second node, the method comprising:

in response to initiation of a boot sequence for the multi-node computer, automatically checking a BIOS image in the first firmware unit in the first node of the multi-node computer for corruption; ~~and~~

determining if the second firmware unit contains a good copy of the BIOS image; and

in response to detecting corruption of the BIOS image in the first firmware unit, and in response to determining that the second firmware unit contains a good copy of the BIOS image, automatically recovering from the corruption of the BIOS image by copying a good BIOS image from the second firmware unit in the second node to the first firmware unit in the first node.

2. (Original) The method of Claim 1, wherein:

the multi-node computer comprises multiple nodes, with each node containing a copy of the BIOS image; and

the method further comprises:

determining if any of the nodes contain a good copy of the BIOS image; and

in response to determining that at least one node contains the good copy of the BIOS image, automatically copying the good copy of the BIOS image to any nodes that contain a corrupted copy of the BIOS image.

3. (Original) The method of Claim 1, wherein:

the first node includes a first central processing unit (CPU) hub, the second node includes a second CPU hub, and the multi-node computer further comprises a multi-port switch for internodal communications;

the method further comprises configuring the multi-port switch to provide a communication path between the first CPU hub and the second CPU hub; and

the operation of automatically recovering from the corruption of the BIOS image comprises copying the good BIOS image from the second node to the first node via the multi-port switch.

4. (Original) The method of Claim 1, wherein:

the first firmware unit comprises a central processing unit (CPU) firmware unit;

the multi-node computer also includes an input/output (I/O) firmware unit; and

the method further comprises:

in response to detecting corruption of the BIOS images in the CPU firmware unit, automatically copying a good BIOS image from the I/O firmware unit to the CPU firmware unit.

5. (Original) The method of Claim 4, wherein:

the first node includes a first CPU hub, the second node includes a second CPU hub, and the multi-node computer further comprises a multi-port switch for internodal communications communicatively interposed between the first CPU hub and the I/O firmware unit; and

the operation of automatically recovering from the corruption of the BIOS image comprises obtaining the good BIOS image from the I/O firmware unit via the multi-port switch.

6. (Original) The method of Claim 4, wherein:

the multi-node computer comprises first and second nodes; and

the method further comprises automatically using a good BIOS image in an I/O firmware unit in the second node to replace first and second bad BIOS images in the CPU firmware units in the first and second nodes, respectively.

7. (Original) The method of Claim 1, wherein:

the multi-node computer comprises multiple nodes;

each node comprises at least one copy of the BIOS image in a central processing unit (CPU) firmware unit and at least one additional copy of the BIOS image in an input/output (I/O) firmware unit;

each node further comprises a set of one or more CPUs;

each node further comprises a CPU hub interposed between the CPU firmware unit and the set of one or more CPUs;

each node further comprises a multi-port switch for internodal communication and an I/O hub interposed in series between the CPU hub and the I/O firmware unit; and

the method further comprises:

checking the CPU firmware units and the I/O firmware units to determine if any of the nodes contain a good copy of the BIOS image; and

in response to determining that at least one of the nodes contains the good copy of the BIOS image, automatically copying the good copy of the BIOS image to all nodes that contain corrupted copies of the BIOS image.

8. (Original) The method of Claim 1, further comprising logging recovery information for future reference.

9. (Currently Amended) A multi-node computer system (MCS) with automatic basic input/output system (BIOS) recovery, the MCS comprising:

a first node that includes a first set of one or more central processing units (CPUs);

a second node communicatively connected to the first node, wherein the second node includes a second set of one or more CPUs;

a first firmware unit in the first node, communicatively connected to the first set of one or more CPUs;

BIOS code in the first firmware unit;

a second firmware unit in the second node that also contains the BIOS code, the second firmware unit communicatively connected to the second set of one or more CPUs; and

BIOS recovery logic, in at least one of the first and second firmware units, that determines if the second firmware unit contains a good copy of the BIOS code, and automatically recovers from BIOS corruption by causing a copy of the BIOS code from the second firmware unit in the second node to be copied to the first firmware unit in the first node, in response to detecting corruption in the BIOS code in the first node, and in response to determining that the second firmware unit contains a good copy of the BIOS code.

10. (Original) The multi-node computer system of Claim 9, wherein:

the MCS comprises multiple nodes, with each node containing a copy of the BIOS code;

the BIOS recovery logic; and

in response to determining that at least one node contains the good copy of the BIOS code, the BIOS recovery logic automatically causes the good copy of the BIOS code to be copied to any nodes that contain a corrupted copy of the BIOS code.

11. (Original) The multi-node computer system of Claim 9, further comprising:

a first CPU hub in the first node communicatively interposed between the first firmware unit and the first set of one or more CPUs;

a second CPU hub in the second node communicatively interposed between the second firmware unit and the second set of one or more CPUs;

a multi-port switch for internodal communications communicatively connected to the first CPU hub and the second CPU hub; and wherein:

the BIOS recovery logic configures the multi-port switch to provide a communication path between the first CPU hub and the second CPU hub; and

the BIOS recovery logic causes copies the good BIOS code from the second node to the first node via the multi-port switch.

12. (Original) The multi-node computer system of Claim 9, wherein:

the first and second firmware units comprise first and second central processing unit (CPU) firmware units;

the MCS further comprises an input/output (I/O) firmware unit communicatively connected to at least one of the first and second CPU firmware units;

the I/O firmware unit also contains the BIOS code; and

in response to detecting corruption of the BIOS code in the first CPU firmware unit, the BIOS recovery logic automatically causes the BIOS code to be copied from the I/O firmware unit to the first CPU firmware unit.

13. (Original) The multi-node computer system of Claim 12, wherein:

the first node comprises a first CPU hub communicatively connected to the first CPU firmware unit;

the second node comprises a second CPU hub communicatively connected to the second CPU firmware unit;

the MCS further comprises a multi-port switch for internodal communications communicatively interposed between the first CPU hub and the I/O firmware unit; and

the BIOS recovery logic causes the BIOS code to be copied from the I/O firmware unit via the multi-port switch.

14. (Currently Amended) The multi-node computer system of Claim 13, wherein:

the MCS further comprises an I/O hub communicatively interposed between the multi-port switch and the I/O firmware unit; and

the BIOS recovery logic causes the BIOS code to be ~~copies~~ copied from the I/O firmware unit via the I/O hub.

15. (Currently Amended) The multi-node computer system of Claim 9, wherein:

the MCS comprises multiple nodes;

each node comprises a set of one or more CPUs;

each node further comprises a CPU firmware unit communicatively connected to the set of one or more CPUs;

each node further comprises a CPU hub interposed between the CPU firmware unit and the set of one or more CPUs;

each node further comprises an input/output (I/O) firmware unit communicatively connected to the CPU hub;

each node further comprises at least one copy of the BIOS code in the CPU firmware unit and at least one copy of the BIOS code in the I/O firmware unit;

each node further comprises a multi-port switch for internodal communication and an I/O hub interposed in series between the CPU hub and the I/O firmware unit;

the BIOS recovery logic checks the CPU firmware units and the I/O firmware units to determine if any of the nodes contain a good copy of the BIOS code; and

in response to determining that at least one of the nodes contains the good copy of the BIOS code, the BIOS recovery logic automatically causes the good copy of the BIOS code to be copied to all nodes that contain corrupted copies of the BIOS code.

16. (Currently Amended) A program product that provides automatic basic input/output system (BIOS) recovery in a multi-node computer system (MCS) with first and second nodes, a first firmware unit in the first node, and a second firmware unit in the second node, the program product comprising:

a computer-usable medium encoding recovery instructions which, when executed, perform operations comprising:

in response to initiation of a boot sequence for the MCS, automatically checking a BIOS image in the first firmware unit in the first node of the MCS for corruption;

automatically determining if the second firmware unit contains a good copy of the BIOS image; and

in response to detecting corruption of the BIOS image in the first firmware unit, and in response to determining that the second firmware unit contains a good copy of the BIOS image, automatically recovering from the corruption of the BIOS image by causing a good BIOS image from the second firmware unit in the second node to be copied to the first firmware unit in the first node.

17. (Original) The program product of Claim 16, wherein:

the MCS comprises multiple nodes, with each node containing a copy of the BIOS image; and

the operations performed by the recovery instructions further comprise:

determining if any of the nodes contain a good copy of the BIOS image; and

in response to determining that at least one node contains the good copy of the BIOS image, automatically copying the good copy of the BIOS image to any nodes that contain a corrupted copy of the BIOS image.

18. (Original) The program product of Claim 16, wherein:

the first node includes a first central processing unit (CPU) hub, the second node includes a second CPU hub, and the MCS further comprises a multi-port switch for internodal communications;

the operations performed by the recovery instructions further comprise configuring the multi-port switch to provide a communication path between the first CPU hub and the second CPU hub; and

the operation of automatically recovering from the corruption of the BIOS image comprises copying the good BIOS image from the second node to the first node via the multi-port switch.

19. (Original) The program product of Claim 16, wherein:

the first firmware unit comprises a central processing unit (CPU) firmware unit;

the MCS further comprises an input/output (I/O) firmware unit; and

the operations performed by the recovery instructions further comprise:

in response to detecting corruption of the BIOS image in the CPU firmware unit, automatically causing a good BIOS image from the I/O firmware unit to be copied to the CPU firmware unit.

20. (Original) The program product of Claim 16, wherein the operations performed by the recovery instructions further comprise logging recovery information for future reference.